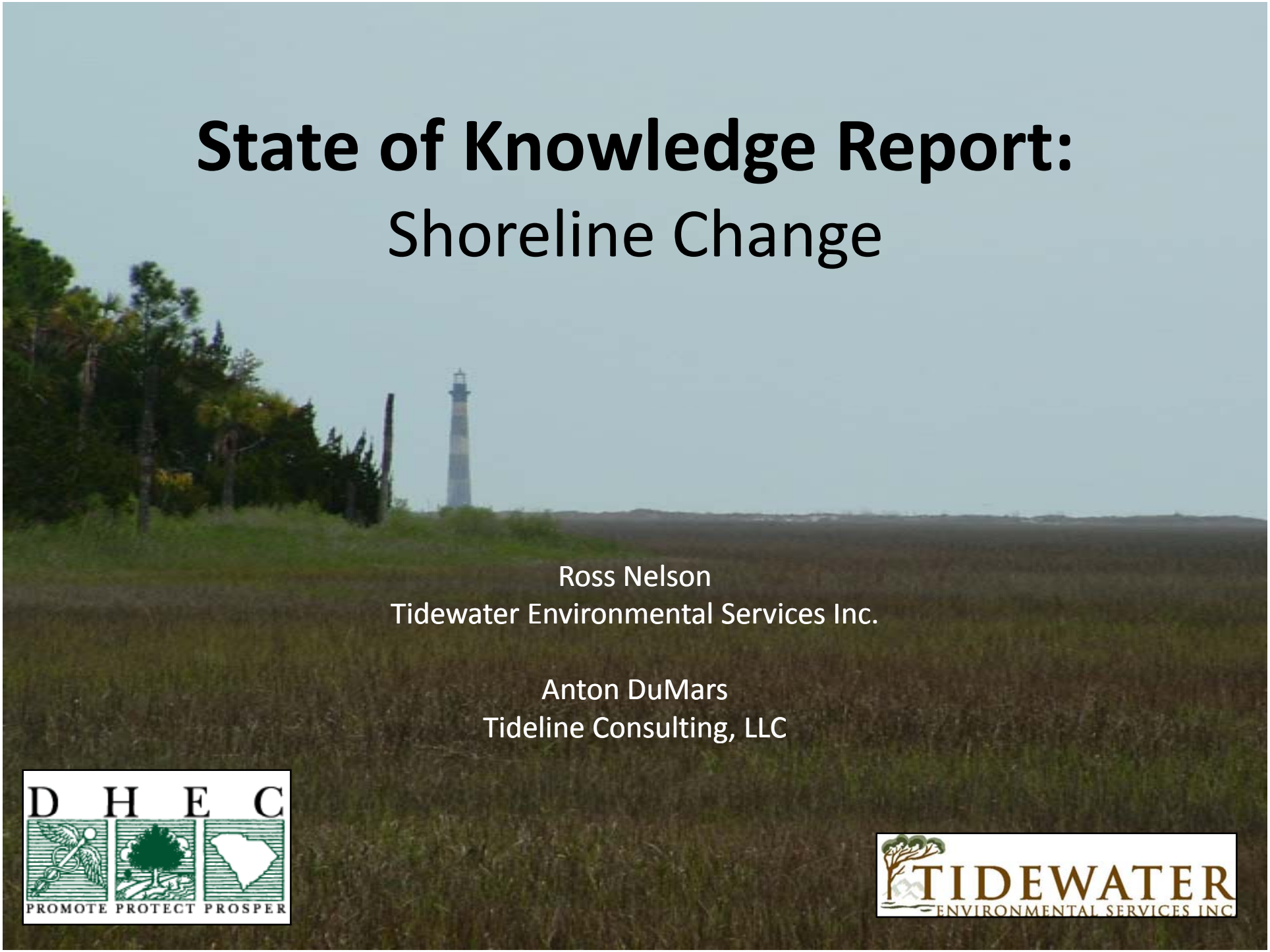
State of Knowledge Report:
Shoreline Change



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TIDEWATER
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Background

- Literature review and database creation
- 4 Major Research Topics
  - Shoreline Positions and Monitoring
  - Sediment Budgets and Erosional Forcings
  - Natural Resources and Community Vulnerability
  - Future Projections and Models of Shoreline Change
- Goals
  - Summarize existing research
  - Guide future research and data collection efforts
    - Identify information needs

Stakeholders

- Local and State Coastal Managers
- South Carolina Sea Grant Consortium
- NOAA Coastal Services Center
- US Army Corps of Engineers
- Research Community
- Consulting Engineers

Relevant Databases

- ISI Web of Science (Science Citation Index)
- Aquatic Science and Fisheries Abstracts
- ASCE CE Database
- National Seagrant Library Online Database
- GeoRef
- Google Scholar Online
- ScienceDirect
- Science.gov
- NOAA CSC Coastal Zone Information Center Digital Collection
- Corps of Engineers ERDC
- Online Library Geological Society of America
- Online Abstract Search American Geophysical Union Earth and Space Index (EASI)
- SCDNR Publications Library
- USGS Online Library

Temporal/Spatial Variation of Studies

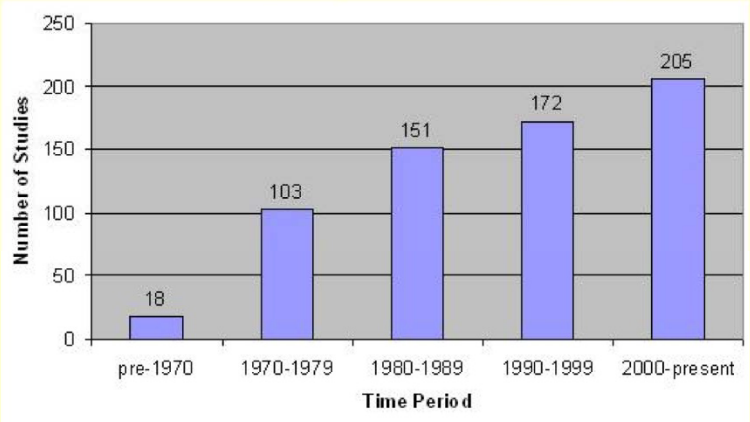
Spatial Breakdown

County	Number of Studies
Jasper	1
Beaufort	73
Colleton	16
Charleston	187
Georgetown	146
Horry	100

*Reflects published studies in scholarly journals, technical documents, conference proceedings, among others.

*Does not include statewide studies, as well as studies with an 'unknown' location (inability to locate document).

Temporal Breakdown



Shoreline Positions and Monitoring

- Approximately 176 out of 649 records fit into the category (≈26%)
- Major Subheadings
  - Coastal Processes, Assessments and Descriptions
    - Geologic Framework and Evolution of Coast
    - Indicators of Shoreline Change
    - Storm Frequency, Effects and Coastal Response
  - Monitoring and Mapping Efforts

Shoreline Positions and Monitoring

- Information Needs identified by Committee
  - Statewide, systematic, interagency LIDAR and aerial imagery initiative and clearinghouse
  - Historic and current digital marsh/estuarine shorelines, monitoring of estuarine shoreline change and marsh migration
  - A shoreline inventory and classification system
  - Focus monitoring efforts on event-based, opportunistic sampling and erosion hotspots
  - Common standards for shoreline definition
  - Sustain the BERM program
- Other Information Needs
  - Factors that improve renourishment efforts and predict environmental influences on beach renourishment

Sediment Budgets and Erosional Forcings

- Approximately 394 out of 649 records fit into the category (≈61%)
- Major Subheadings
  - Sediment Characteristics and Analysis
  - Antecedent Geology/Coastal Sedimentation Processes
    - Coastal Plain
    - Back Barrier
    - Barrier and Tidal Inlet
    - Nearshore
    - Continental Shelf
  - Anthropogenic Effects
    - Beach Renourishment Efforts
    - Erosion Control and Analysis
    - Sedimentation Processes Near OMDS Sites

Sediment Budgets and Erosional Forcings

- Information Needs identified by Committee
  - Better understanding of sediment transport
  - Wave monitoring and generation of "coastal climatology," including waves, surface currents, winds, storm frequencies, etc.
  - Additional geologic framework studies for the rest of the coast, including areas out to 5 miles offshore and marshes and positions of historical inlet/river channels
  - Research and monitoring of riverine/estuarine sediment dynamics and anthropogenic effects

Natural Resources and Community Vulnerability

- Approximately 56 out of 649 records fit into the category (≈9%)
- Major Subheadings
  - Natural, Cultural and Economic Resources, Maps and Databases
  - Planning and Support Tools for Communities
    - Sea Level Rise and Coastal Response to Shoreline Change
    - Coastal Management in Relation to Shoreline Change
    - Storm Activity in Relation to Global Warming
  - Risk Mapping Using Modeled Scenarios

Natural Resources and Community Vulnerability

- Information Needs identified by Committee
  - Improved maps and natural, cultural, and economic resources in close proximity to beachfront and estuarine shorelines
  - Planning/decision support tools for communities; quantifying risk and vulnerabilities, mitigation plans, historic shoreline/erosion rates, renourishment projects, infrastructure, etc.
  - Risk mapping using modeled scenarios for prioritizing resources
  - Economic assessments of the costs of enforcing the retreat policy, establishing a tipping point for renourishment by location, or making decisions from wrong projections

Future Projections and Models of Shoreline Change

- Approximately 23 out of 649 records fit into the category (≈4%)
- Major Subheadings
  - Predictive Models of Coastal Processes and Dynamics
- Information Needs identified by Committee
  - Integrate natural and socioeconomic models of shoreline change
  - Improved models that predict coastal wetland and beach erosion, migration, and vertical accretion in response to elevated sea level rise scenarios
  - Improved models of inlet processes and dynamics
  - Clarifying uncertainties with respect to shoreline positions, reference datum, and projections

Next Steps

- Incorporate comments from committee
- Finalize report and submit to OCRM
- Finalize database
  - Currently in EndNote
  - Microsoft Access version will also be available
  - Database will be available through OCRM
- Incorporate report into Final Shoreline Change Committee report